Python test frameworks - doctest and py.test

Women Who Code

Women Who Code (WWC) is a global non-profit dedicated to inspiring women to excel in technology careers. We work to support this generation in being and becoming leaders and role models in the tech industry.

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- ★ Visit our Meetup site: https://www.meetup.com/Women-Who-Code-DC/
- ★ Request to join our Slack chat website: http://bit.ly/wwcdcslack
- ★ Python Beginners: 1st Wednesday of every other month
- ★ Python Lab: 3rd Wednesday of the month

Hello!

I am Elvita Lobo
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HOUSEKEEPING

- Use Zoom chat for questions.
- To get started, save a copy of the code to your local machine:
  - Have your IDE set up so you can run Python code (PyCharm is a good one to have - https://www.jetbrains.com/pycharm/download/)
  - Install py.test
    - pip install -U pytest
  - Get the code for the lab
    - git clone https://github.com/womenwhocodedc/python-community.git
    - cd python-community/testframeworks

Goals for this lab

- Learn one new thing about doctest or pytest
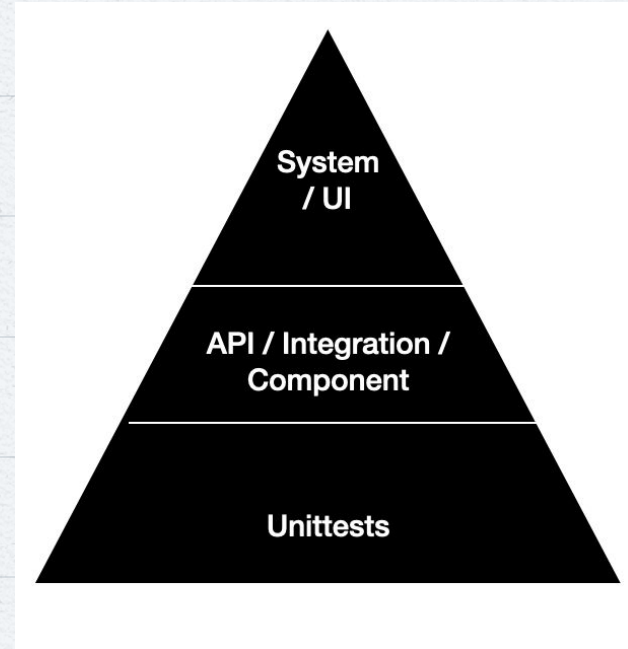- Go back to a codebase and write/improve documentation or unittests

A Quick Overview

What are the different levels of testing?

- Code reviews and Code inspection
- Regression tests
- Integration tests
- Acceptance tests (aka Qualification tests, validation tests)
- System tests

What are the different types of testing?

- Unittests ---> `Focus of this lab!!`
- Functional
- Compatibility
- Usability
- Fault Injection
- Performance
- Reliability
- Stress
- Chaos
- Security
- Maintainability
- Portability

Unittests

- The goal of unittests is rapid feedback (minutes)
- Test Driven Development - define unittests before writing code
- Can be hooked up to automation via a unittest framework

What is a unittest framework?

- Allows you to test code in small increments (per function) in an independent and repeatable fashion
- Allows you to organize your tests in a similar way to which your code is organized
- Ability to resume remaining tests even if there is a failure, thus allowing you to detect and fix multiple bugs in single run-edit-compile cycle
- Test cases are written as functions

Example Time!

We will be working through the example posted in the Meetup and in chat

RECAP (py.test)

In this lab we learned how to:

- Write unittests using simple functions and assert
- Launch from command line (py.test test1.py)
- Check for standard errors/exceptions
- Print custom error messages
- No soft asserts unlike Gtest/JUnit
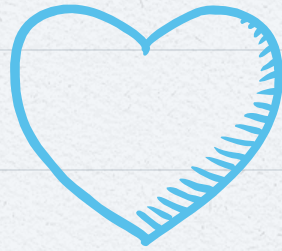
Resources <3

★ Our WWCodeDC Python Github:

https://github.com/womenwhocodedc/python-community

★ Inspiration for this lab:

- ○ Keynote - Preventing, Finding, and Fixing Bugs On a Time Budget | Raymond Hettinger @ PyBay2018 https://www.youtube.com/watch?v=ARKbfWk4Xyw&t=931s
- ○ Google test - https://github.com/google/googletest/blob/master/docs/primer.md
- ○ Unity (c) - http://www.throwtheswitch.org/unity
- ○ JUnit - https://junit.org/junit5/docs/current/user-guide/
- ○ Py.test - https://docs.pytest.org/en/stable/contents.html#toc

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	Pytest	JUnit	Gtest
Language	Python	Java	C++
Client side testing	Yes	Yes	Yes
Server side testing	Yes	Yes	Yes
Fixtures **(same data multiple tests)**	Yes - JUnit contains a setUp() method, which runs before every test invocation and a tearDown() method, which runs after every test method.	Yes - Pytest has a powerful yet simple fixture model that is unmatched in any other testing framework.	Yes
Group fixtures	Pytest's powerful fixture model allows grouping of fixtures	You can use setUp() and tearDown() inbuilt functions as group fixtures.	Yes
Generators	You can use JUnit-quickcheck to generate test data	pytest has a hook function called pytest_generate_tests hook which is called when collecting a test function and one can use it to generate data	?
License	MIT	MIT	BSD 3-clause
Mocks (replace objects to speed up testing)	Yes	Mockito	Yes

THANKS!

Any questions?

You can find me on Women Who Code DC Slack
@ElvitaLobo

CREDITS

Special thanks to all the people who made and released these awesome resources for free:

✘ Presentation template by SlidesCarnival
✘ Photographs by Unsplash